UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 10/777,499 | 02/12/2004 | Jialin Zou | LUCW:0010 | 5262 |

48671 7590 12/12/2007
FLETCHER YODER (LUCENT)
P.O. BOX 692289
HOUSTON, TX 77069

| EXAMINER | |
|---|---|
| SOBUTKA, PHILIP | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2618 | |

| MAIL DATE | DELIVERY MODE |
|---|---|
| 12/12/2007 | PAPER |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/777,499 | ZOU, JIALIN | |
| | Examiner | Art Unit | |
| | Philip J. Sobutka | 2618 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *26 September 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1,4-10,12-22 and 24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,4-10,12-22 and 24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *12 February 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 4-8, 10, 12-14, 19, 21, 22 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Amerga et al (US 2003/0013457).

Consider claim 1. Amerga teaches a device for searching signal paths comprising:

a first stage configured to sort a plurality of signal energies according to a heapsort algorithm (Amerga see paragraph 61) into one of a plurality of ordered candidate signal lists associated with one of a plurality of antennas based on the strength of the plurality of signal energies (Amerga see for example figure 2, items p120-p140); and

a second stage configured to sort the plurality of ordered candidate signal lists into a signal path list that is ordered based on the strength of the plurality of signal energies in the plurality of ordered candidate signal lists (Amerga see for example figure 5b).

Amerga fails to teach the heapsort is an n out of N algorithm, i.e. only presenting the best number 'n' out of the total number 'N' sorted. Official Notice is taken that a mathematical algorithm can be arranged to present any desired outcome. Therefore it

would have been obvious to one of ordinary skill in the art to modify the algorithm to only supply a number limited to the number of potentially useful candidate signals rather than any possible number, i.e. n out of N.

As to claim 4, note that a heapsort is performed using a retire and promote process.

Consider claim 5. Amerga teaches the device, as set forth in claim 1, wherein the second stage comprises a sorting algorithm (Amerga see paragraph 61).

Consider claim 6. Amerga teaches the device, as set forth in claim 5, wherein the sorting algorithm comprises a two-level grouping algorithm (Amerga see for example figure 5b, paragraphs 19, 20,61-66).

Consider claim 7. Amerga teaches the device, as set forth in claim 6, wherein the two-level grouping algorithm comprises a lead signal sorting process that creates a lead signal list from the largest of the plurality of signal energies in each of the plurality of ordered candidate signal lists and a promotion and replacement process that replaces one of a plurality of lead signals that is placed into the signal path list with another of the plurality of signal energies from one of the plurality of ordered candidate signal lists (Amerga see for example figure 5b, paragraphs 19, 20,61-66).

Consider claim 8. Amerga teaches a base station comprising:

a plurality of radio frequency systems (Amerga see paragraphs 2-7, 18-20);

a baseband system coupled to the plurality of radio frequency systems and having a reverse link searcher configured to (Amerga, see figures 11,12, paragraphs 77-82, note that the processor would be a baseband system):

order a plurality of signal energies according to a heapsort algorithm (Amerga see paragraph 61) into one of a plurality candidate signal lists for each of the plurality of radio frequency systems based on the strength of the plurality of signal energies (Amerga see for example figure 2, items p120-p140) and

order the plurality of candidate signal lists into a signal path list based on the strength of the plurality of signal energies in the plurality of candidate signal lists (Amerga see for example figure 5b).

Amerga fails to teach the heapsort is an n out of N algorithm, i.e. only presenting the best number 'n' out of the total number 'N' sorted. Official Notice is taken that a mathematical algorithm can be arranged to present any desired outcome. Therefore it would have been obvious to one of ordinary skill in the art to modify the algorithm to only supply a number limited to the number of potentially useful candidate signals rather than any possible number, i.e. n out of N.

Consider claim 10. Amerga teaches the base station, as set forth in claim 8, wherein the reverse link searcher comprises a digital signal processor (Amerga, see figures 11,12, paragraphs 77-82).

Consider claim 12. Amerga teaches the base station, as set forth in claim 10, wherein the reverse link searcher comprises a two-level grouping algorithm that is a software routine utilized by the digital signal processor to order the plurality of candidate signal lists (Amerga see for example figure 5b, paragraphs 19, 20,61-66).

Consider claim 13. Amerga teaches a wireless communications system comprising:

at least one wireless unit (Amerga see figure 1);

at least one radio frequency system having a plurality of antennas adapted to communicate with the at least one wireless unit (Amerga, see for example figures 2, 5); and

a baseband system having a processor and a reverse link searcher, the reverse link searcher comprising (Amerga, see figures 11,12, paragraphs 77-82, note that the processor would be a baseband system):

a first stage configured to sort a plurality of signal energies according to a heapsort algorithm (Amerga see paragraph 61) based on the strength of each of the plurality of signal energies and create one of a plurality of candidate signal lists having a plurality of ordered candidate signal energies associated with one of the plurality of antennas (Amerga see for example figure 2, items p120-p140); and

a second stage configured to sort the plurality of candidate signal lists into a path selection list based on the strength of each of the plurality of candidate signal energies (Amerga see for example figure 5b).

Amerga fails to teach the heapsort is an n out of N algorithm, i.e. only presenting the best number 'n' out of the total number 'N' sorted. Official Notice is taken that a mathematical algorithm can be arranged to present any desired outcome. Therefore it would have been obvious to one of ordinary skill in the art to modify the algorithm to

only supply a number limited to the number of potentially useful candidate signals rather than any possible number, i.e. n out of N.

Consider claim 14. Amerga teaches the system, as set forth in claim 13, wherein the at least one radio frequency system communicates with the at least one wireless unit via a code division multiple access system (Amerga see paragraphs 12).

Consider claim 19. Amerga teaches the system, as set forth in claim 13, wherein the at least one wireless unit comprises a cellular telephone (Amerga see for example paragraph 7)

Consider claim 21. Amerga teaches a method of searching comprising:

sorting a plurality of signal energies according to a heapsort algorithm (Amerga see paragraph 61) into one of a plurality of ordered candidate signal lists based on the strength of the plurality of signal energies (Amerga see for example figure 2, items p120-p140); and

sorting the plurality of ordered candidate signal lists into a signal path list that is ordered based on the strength of the plurality of signal energies in the plurality of ordered candidate signal lists (Amerga see for example figure 5b).

Amerga fails to teach the heapsort is an n out of N algorithm, i.e. only presenting the best number 'n' out of the total number 'N' sorted. Official Notice is taken that a mathematical algorithm can be arranged to present any desired outcome. Therefore it would have been obvious to one of ordinary skill in the art to modify the algorithm to

only supply a number limited to the number of potentially useful candidate signals rather than any possible number, i.e. n out of N.

Consider claim 22. Amerga teaches the method, as set forth in claim 21, comprising the act of providing the path selection list to a processor for selecting a signal path for a connection with a wireless unit (Amerga see for example figure 5b).

Consider claim 24. Amerga teaches the method, as set forth in claim 21, wherein the sorting the plurality of candidate signal energies into the path selection list comprises utilizing a two-level grouping-sorting algorithm (Amerga see for example figure 5b, paragraphs 19, 20,61-66).

3. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Amerga in view of Okamoto et al (US 2003/0128243)7.

Consider claim 9. Amerga lacks a teaching of the base station, as set forth in claim 8, wherein the reverse link searcher comprises a hybrid device having a field programmable gate array and a digital signal processor.

Note that Amerga teaches a processor and notes that an array of logic elements may be included (Amerga see paragraph 77). Okamoto teaches that field programmable gate arrays (FPGA's) allow for correction because reprogramming is possible (see paragraph 38). It would have bee obvious to modify Amerga to use programmable gates in the logic array in order to allow for easy reprogramming.

4. Claims 15-17, are rejected under 35 U.S.C. 103(a) as being unpatentable over Amerga in view of George (US 5,214,789).

Amerga lacks a teaching of the system, as set forth in claim 14, wherein the at least one radio frequency system comprises a structure, a tower or building on which the plurality of antennas reside.

George teaches placing antennas on structures such as towers or buildings in order to extend the range of communication (see column 1, lines 12-20). Therefore it would have been obvious to one of ordinary skill in the art to modify Amerga as shown in the claims in order to place the antenna on a high location to extend the range of communication.

5. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Amerga in view of Paajanen et al (US 5,189,632).

Consider claim 18. Amerga lacks a teaching of the system, as set forth in claim 13, wherein the at least one wireless unit comprises at least one portable computer system.

Paajanen teaches a portable computer equipped with wireless telephone units (see figures 1a,3, column 1, lines 25-55). Therefore it would have been obvious to one of ordinary skill in the art to modify Amerga as shown in the claims in order to allow for the communication unit to provide the functionalities of a computer.

6. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Amerga in view of Peiker et al (US 4,723281).

Consider claim 20. Amerga lacks a teaching of the system, as set forth in claim 13, wherein the at least one wireless unit comprises a vehicle having a mobile telephone. Note that Amerga teaches that the wireless unit comprises a cellular telephone (Amerga see for example paragraph 7).

Peiker teaches a vehicle having a mobile telephone (see abstract, column 1, lines 4-30). It would have been obvious to one of ordinary skill in the art to modify Amerga to provide the mobile phone as vehicle equipment as taught by Peiker in order to allow for its use when using the vehicle.

**Response to Amendment**

7. Applicant's arguments with respect to claim1, 4-10, 12-22,and 24 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

8. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Philip J Sobutka whose telephone number is 571-272-7887. The examiner can normally be reached Monday through Friday from 8:30 - 5:00.

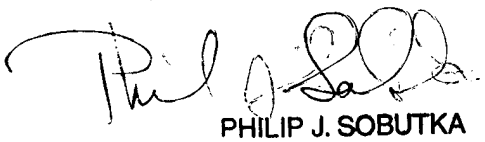
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew D. Anderson can be reached on 571-272-4711.

10. The central fax phone number for the Office is 571-273-8300.

Most facsimile-transmitted patent application related correspondence is required to be sent to the Central FAX Number.

CENTRALIZED DELIVERY POLICY: For patent related correspondence, hand carry deliveries must be made to the Customer Service Window (now located at the Randolph Building, 401 Dulany Street, Alexandria, VA 22314), and facsimile transmissions must be sent to the Central FAX number, unless an exception applies. For example, if the examiner has rejected claims in a regular U.S. patent application, and the reply to the examiner's Office action is desired to be transmitted by facsimile rather than mailed, the reply must be sent to the Central FAX Number.

11. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



PHILIP J. SOBUTKA
PATENT EXAMINER

12/7/7

Philip J Sobutka

(571) 272-7887